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ABSTRACT

A major goal of the Shoreline School District is to develop partnerships with the community, other community agencies, and businesses. The development of a "Long Range Facilities Utilization Plan" led to a 10-year districtwide modernization program to enhance technology and instruction. Now at its midpoint, the design and development of the program is a significant strand in the fabric of a total district effort to strengthen academic programs and improve the technology/learning process. The following six related elements are described. An integrative fibre optics communications infrastructure is linking the Shoreline Center complex with the districts' 14 schools. High technology hardware and software are being used by administrators, teachers, and students to support instruction. The development of staff training serves to prepare all district employees to use the new technology. The creation of the "Education for Tomorrow...Today" project utilizes a "Classroom of the Future" and serves as a major development and evaluation center. The formulation of significant business partnerships increases access to new technology and offsets costs. The formulation of significant community partnerships provides service to all citizens in the Shoreline area. This includes expanding the scope of the school district in implementing quality of life programs in the community. (RR)

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Abstract

The Shoreline School District in Seattle, Washington has adopted a dual mission which includes providing quality education for students as well as working to improve the quality of life in the community. The quality of life portion of this mission addresses the demographic realities of a changing population and has greatly increased the scope of services and facilities available to the community. It is recognized that education is at a crossroads and the task of providing quality education is too important to leave to educators alone.

In light of this, one of the major goals of the Shoreline School District is to develop partnerships with our community, other community agencies, and businesses. This involvement process and sensitivity to the expanded scope of community needs has netted unprecedented support from the Shoreline community. The result of this support has been translated into a total modernization of the district's schools and playfields and the development of the Shoreline Center, which includes a senior citizens' center, conference center, performing arts theatre, administrative offices, community center, and a technology "Classroom of the Future." Partnerships with a number of companies have assisted Shoreline in being recognized as one of the leading districts in the United States utilizing technology to enhance instructional programs.

Introduction

Exciting things can happen in a community when imagination, vision, commitment, trust, and hard work come together. The residents of the Shoreline School District north of Seattle, Washington met the challenge of a declining enrollment a few years ago and have transformed liabilities into assets for the betterment of the entire community. The "Shoreline Story" can be an inspiration and "blueprint for action" for other communities facing similar challenges.

Following the development of a **Long Range Facilities Utilization Plan**, the Shoreline community approved two capital bond measures designed to support a district-wide modernization and technology enhancement program. The financial cost of the program totals approximately $120 million, with a portion of this total coming from state matching funds, bond interest earnings, and property sale and lease revenue.

Shoreline is now at the midpoint of its ten-year program. In addition to the improved educational facilities and technological innovations which greatly enhance the delivery of the instructional program, there has been a very positive impact on the entire community. With the school board, administrative team, teaching and support staff, and community working together with a common goal, the quality of life of the entire community has been greatly enhanced.

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Outline of Program and Method

Since its formation in 1944, the Shoreline School District has continued to develop and refine its instructional programs to ensure that they meet the diverse needs of the district's 9,500 students. This dynamic process of curriculum development and related instructional improvement draws its impetus from a proactive philosophy of education which seeks to assist each student to acquire the practical, creative, and personalized skills needed to function effectively as a member of an increasingly complex society and world community.

The design and development of Shoreline's technology and instructional enhancement program forms a significant strand in the fabric of a total district effort to strengthen academic programs and improve the teaching/learning process. This program contains six related elements:

1. Establishment of an integrative fiber optics communications infrastructure to link the Shoreline Center complex with the district's 14 schools.

The concept for the fiber optic highway arose out of a dual need. The communications system in the district was unable to provide the flexibility and expansion needed. In searching for a solution, a system was designed that would allow for ample growth while also introducing new personal productivity features. The communications system is built around the deployment of digital phone switches, one located in every school site. The switches are to be connected by a seventeen mile district-owned fiber optic highway. The highway, phone switches, phone devices and all wiring are to be purchased from capital funds. By purchasing the system in this fashion, the operations budget is relieved of approximately $200,000 per year, allowing the new system price to be totally amortized in about seven years.

This infrastructure represents a new era in instructional networking. The system is designed and implemented to provide voice, video, and data communications to every instructional space. The intent is to provide an "information rich environment" to every classroom teacher and student. The fiber and the networking represent a conduit that will be used to ship information of many different types to each classroom and instructional space.

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conduit that will be used to ship information of many different types to each classroom and instructional space. To do this, certain physical infrastructures needed to be incorporated into the classroom design. Very simply put, these are the rules:

- Every instructional space will have a television
- Every place there is a television there are four strands of 62.5 multi-mode fiber
- Every room with television has a telephone
- Every place there is a telephone there is a data jack
- All telephones and data jacks are twisted pair copper wire
- Each instrument or jack will be allotted four twisted pair
- Transmissions between buildings will all be on fiber optic cable

The types of information to be sent down the network include:

- An on-line database of all district media maintained on a multi-user unix server to provide key word searching and check-out from the classroom of the district's vast collection of video disc, video tape, and other related classroom media.

- The video database will be enhanced by the utilization of a district-wide media collection that can be accessed immediately by a classroom teacher through the utilization of centrally located source equipment and video switch device. This video switch will send any form of video or audio media over the fiber highway to the television in each classroom. The switch is controlled by any teacher in their instructional space by using a remote control device.

- An on-line union list of the entire district library holdings available for searching from classrooms and library spaces.

- Telephone communication from each classroom with voice mail and other productivity advances for each classroom teacher, administrator, and staff member.

- Two way interactive communication from every instructional space in voice, video, and data modes so that all classrooms can become an interactive distance learning environment connected to each other in real time to allow sharing of ideas, concepts, and processes.

- Distribution of cable television and satellite downlinks to the television located in each instructional space as well as the provision for future uplinks from our classrooms to other classrooms in the region, country, and around the world.

The construction of the campus-wide network requires about 89,000 feet of external fiber optic cable. The span is nearly 17 miles around a suburb of Seattle, Washington. The construction of the network incorporates the use of digital phone switches at each building as well as the use of a analog video switching device and centrally located video delivery system. Fiber optic cable was indentified as the delivery medium because of its incredible bandwidth, lack of sensitivity to electromagnetic interference, and the low attenuation or signal loss over long hauls. Multi-mode fiber is less expensive than alternative single-mode fiber in both the Electronics required for transmission and reception as well as installation operations, such as splicing and termination. The fiber selected is the material identified as the standard size fiber for the emerging standard in the information industry. The 62.5 multi-mode fiber is the transmission medium for the FDDI standard. FDDI, or Fiber Data Distributed Interface, is a standard for 100-mbps data transmission.

Lack of attenuation and resistance to electromagnetic interference are powerful argument for using fiber in the network, but the most impressive quality of fiber is the incredible bandwidth. Schools and their information systems need to be built for the next fifty years of usage. The local press, the trade journals, and even popular magazines are exploring the communications futures for the year 2000 and beyond. Plans to deliver massive amounts of data and video via fiber right to the home are already underway in many test locations around the world. The use of fiber is a foregone conclusion. FDDI is already shipping 100 mbps over fiber. With the increased power of emerging electronics, 150 mbps and more will soon be available. Massive bandwidth, along with new compression techniques and other algorithms, will make data available to everyone. Schools need to provide preparation and practice with the medium. This proactive stance and involvement has the opportunity to produce the rich development delta for new forms of content. Education must be in the loop to ensure that quality content is developed for, as well as incorporated into, classrooms.

2. Selection, acquisition and placement of high technology hardware and software in the hands of administrators, teachers, and students to support instruction.

Every teacher, administrator, and secretary has access to their own personal computer as a personal productivity tool.

We expect our students to access, process, and produce information. Educators and parents alike realize that students need to use computers as an aid in these activities. And since teachers serve as the major information source in the classroom, it follows that access to computers is imperative for them as well.

The Computer for the Teacher program guarantees that each full-time teacher in the district will have their own computer as long as they work for Shoreline. The District owns, insures, and maintains the computers. They are given to each teacher under an agreement specifying that the

machine may be used at home, in the classroom, or where, as long as the teacher is employed by the District. It is their own personal productivity tool. It is our belief that teachers are the most important members of our team. If we expect to model the use of technology, as well as reap the benefits of added productivity, it is paramount that teachers be empowered with the best tools available.

Each of the members of the school board are using a district computer, software, and modem to communicate via a district maintained electronic mail system. This system is a model for the system that will be available for all staff and students as the fiber network is implemented. The school board uses the electronic mail to stay informed of daily events without the use of endless amounts of paper. The model is both environmentally sensitive and a highly visible example of increased productivity and communication through the use of technology.

All teachers have copies of Microsoft Works software as their primary productivity tool. There are many other software products available including other word processors, databases, and spreadsheets, as well as specific instructional software products for classroom use.

Each of the district buildings contain a computer lab and many have more than one. All elementary classrooms have a computer as standard equipment and the goal for the upcoming five years is to introduce distributed information systems to up to four computers in each instructional space.

Special needs are being addressed by special products. There are many examples; two noteworthy programs include an ILS system used with some secondary students to individualize the study of basic skills and the music program is highly visible with its incorporation of midi hardware and software.

3. Development of a comprehensive approach to staff training which serves to prepare all district employees to effectively and creatively use the new technology that is available to them.

The Computer Resource Teacher or CRT program provides leadership in each building for the utilization of technology through building-based personalized training opportunities for all staff. The success of integrating technology into the educational program can be directly traced to these inspiring staff members. The CRT program has been a mainstay of Shoreline technology implementation since the early 1980's.

A comprehensive staff development program associated with the Computer for the Teacher program resulted in over three hundred classes being offered at school sites by school based trainers in 1989-90. These courses were developed in conjunction with staff and business partnerships. Trainer compensation models were highly creative. Money is not the only, and not always the best, form of compensation.

Shoreline has an ongoing commitment to staff development which is evidenced by our comprehensive stipend program. Each year hundreds of courses are offered in many topics including technology. We have satellite downlink capabilities with national and regional staff development opportunities and are constructing a district television studio that will be used to produce and broadcast our own and cooperative staff development workshops.

4. Creation of the "Education for Tomorrow...Today" project which utilizes a "Classroom of the Future" to serve as a major testing and development center for both the use of emergent technologies and the study of their instructional applications.

The "Classroom of the Future" is a dynamic instructional space located at the Shoreline Center. The site is used for experimentation with the newest technologies available and is a living laboratory for students, teachers and staff members. All members of the Shoreline community are invited to experiment with their ideas within its walls. To this date, kindergarten to adult education classes have taken advantage of the space. Chairs, tables, equipment, and wiring have been designed with maximum flexibility in mind. It is a learner's space.

The "Education for Tomorrow...Today" project considers the "Classroom of the Future" a laboratory. Like other laboratories, it is a testing ground. As concepts are tested and refined, the successful implementations are moved from the lab into the classrooms. An example of this sort of horizontal implementation is the "Knowledge Station." The multi-media "Knowledge Station" consists of a computer, videodisc player, audio-overdubbing VHS video tape recorder, CD-ROM reader, high quality video monitor, voice and video digitizing equipment, and software. These systems were modeled in the "Classroom of the Future" and then placed in each of the school libraries for student use as investigative tools or production tools for the submission of multi-media student reports.

5. Formulation of significant business partnerships designed to increase the district's access to new technology and to offset the costs associated with its purchase, placement, and staff development requirements.

Business partnerships comprise a valuable method of gaining expertise not available in school district staff. Partnerships include the use of loaned executives, specialists, and consultants to more fully explore solutions to educational questions.

Exposure to questions and their solutions is an important factor in developing a program. Business partnerships provide the opportunity for on-site investigations by district staff members of innovative systems and their results.

The district is investigating the possibilities of partnering with local cable television companies, as well as cable commissioners, to provide our instructional programs to the homes of the community. Activities in the classroom, staff development opportunities, district information, or sporting and performing events will be sent right into the home using the video networking system and a cable partnership.

Local universities and their teacher training programs are interested in forming partnerships with Shoreline to provide added experiences and exposure to the classroom for their teacher candidates. A fiber optic connection is under study utilizing partnerships with public and private institutions helping to fund the highway.

Business partners are utilizing our large conference center for satellite downlinks. Product announcements, training classes, and teleconferencing have all taken place in our conference center developed with the capacity for groups of up to one thousand. The conference center is connected to the video, data, and voice networks and includes an auditorium, lecture hall, break-out rooms, dining room and kitchen capable of providing service to business and community partners as well as district staff.

6. Formulation of significant community partnerships designed to provide service to all citizens in the Shoreline area as we expand the scope of the school district to include quality of life programs to our community.

The Shoreline Center complex houses community classrooms, office space for community concerns, as well as a senior citizens' center building complete with an exercise room, craft area, meeting rooms, and a modern kitchen and dining space.

The county and the district partnered to construct new lighted soccer fields for the community.

All school buildings are being modernized. Projects all include the total renovation of the school playfield including new turf and new playground equipment .

These and many more quality of life programs have generated community involvement that has enabled the district to acquire the funding for the technology program.

Conclusion

The impact of the Shoreline community's commitment to its dual mission is clearly evident to the many visitors who now come to experience the "Shoreline Story" firsthand. The focal point of the commitment and effort has been, and will continue to be, the learner in the classroom. However, the role of the school district in having a positive impact on the quality of life in the community is a new concept to some visitors. In Shoreline, we think the link between schools and community are vital and both benefit from nurturing this relationship.

Shoreline has long recognized the need to utilize "state-of-the-art" technology in enhancing the instructional program. The "Education for Tomorrow...Today" program is a commitment to give students the tools necessary to succeed in the world of tomorrow. Shoreline is not resting on its accomplishments, but rather exploring new frontiers to provide the optimum learning experiences for students. It's exciting to see what happens when imagination, vision, commitment, trust, and hard work come together.